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Low dietary protein provision during fetal life in several generations in mink

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Low protein (LP) provision during gestation has been shown to induce structural and functional metabolic changes in the offspring, primarily through adaptations aimed towards maximizing the utilization of those nutrients that are available so as to optimize fetal development and survival. Maternal LP provision could be expected to cause a mismatch between prenatal and postnatal life, because growing mink kits usually are provided with high levels of protein and energy. Our objectives were to investigate how LP provision in late gestation affects the reproductive performance, kit survival rate and pre-weaning kit growth of F₁, F₂ and F₃ offspring from dams fed an LP diet in late gestation, raised in small (4-6 kits) or large (8-10 kits) litters until weaning. Sixty-nine dams consisting of 20 control (C), 22 adequately treated (APAP), 13 born by mothers fed an LP diet during late gestation (APLP) and 14 dams born by mothers exposed to LP during late fetal life and fed an LP diet during late gestation (LPLP) were used. C dams were fed an adequate protein diet (AP – 30% of metabolizable energy (ME) from protein) the entire gestation whereas APAP, APLP and LPLP dams were fed an LP diet (19% of ME) in late gestation. The reproductive performance was not affected by gestation diets but the results indicate that dams exposed to LP during fetal life and fed an LP diet during late gestation gave birth to larger litters and had fewer stillborn kits than APAP dams fed an LP diet during late gestation. The birth weight of F₁ kits born by mothers fed an LP diet during late gestation was lower ($P < 0.05$) than that of controls which confirms previous results. The growth rate of the kits during lactation indicated that kit exposed to LP during fetal life performed better in larger litters than adequately treated ones especially in the transition period from milk to solid feed and around weaning ($P < 0.05$).

Natural or synthetic vitamin E for mink kitsS.K. Jensen¹, T.N. Clausen² and P.F. Larsen²*¹Aarhus University, Department of Animal Sciences, Blichers Alle 20, 8830 Tjelse, Denmark, ²Copenhagen Fur, Agro Food Park, 8200 Aarhus N, Denmark; sorenkrogh.jensen@agrsci.dk*

Vitamin E is a very important, but also expensive component in mink feed. For commercial use 3 types of vitamin compounds is of interest. Thus, it is of interest to elucidate the relative bioefficiency of the expensive natural vitamin E on alcohol form (RRR- α -tocopherol) and the cheaper natural acetate form (RRR- α -tocopherylacetat) against the cheapest form, synthetic vitamin E (all-rac- α -tocopherylacetat). Twelve groups of 12 mink, 4 week of age were allocated to 4 levels of vitamin E (50, 75, 100 or 150 mg/kg feed) of one of the 3 types of vitamin E, in addition a vitamin E free group served as control. After 3 or 6 weeks on the experimental diets, six mink were sacrificed and plasma, liver, heart, lung and brain was removed, weighed and subsequent analysed for vitamin E content and stereoisomer composition. After 3 and 6 weeks on the experimental diets, α -tocopherol concentration in plasma and tissue was significant higher in mink fed natural vitamin E compared to synthetic vitamin E and dose response curves for the 3 types of vitamin E showed significant differences in non-linear regression curves for plasma and tissues. Likewise the biodiscrimination of the different stereoisomers varied between the different tissues. RRR- α -tocopherol showed the highest bioefficiency and synthetic all-rac- α -tocopherylacetat the lowest bioefficiency.

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